CLAIMS

WE CLAIM:

1. A co-polymer comprising a first repeating unit derived from an alkyl or aryl methacrylate monomer and a second repeating unit derived from a phosphate-containing monomer having the formula

$$H_2C=C(-CH_3)-X$$

wherein X is selected from the group consisting of $-O-PH_2O_3$ and $-R-O-PH_2O_3$,
wherein the R group in $-R-O-PH_2O_3$ is selected from the group consisting of $-COO-CH_2-CH_2$ and a straight or branched alkyl chain of 10 carbon atoms or less,
wherein the two methylene groups in $-COO-CH_2-CH_2$ and the alkyl carbon chain can be substituted with an aryl group, a cycloalkyl group or both.

2. The co-polymer of claim 1, wherein the first repeating unit is derived from an alkyl or aryl methacrylate monomer that has 10 carbons or less.

3. The co-polymer of claim 1, wherein the first repeating unit is derived from methyl methacrylate.

4. The co-polymer of claim 1, wherein the second repeating unit is derived from methallyl phosphate.

5. The co-polymer of claim 1, wherein the second repeating unit is derived from ethylene glycol methacrylate phosphate.

6. The co-polymer of claim 1, wherein the molar ratio of the first repeating unit to the second repeating unit is at least 60 to 40.

7. The co-polymer of claim 1, wherein the molar ratio of the first repeating unit to the second repeating unit is at least 70 to 30.

8. The co-polymer of claim 1, wherein the molar ratio of the first repeating unit to the second repeating unit is at least 75 to 25.

9. The co-polymer of claim 1, wherein the molar ratio of the first repeating unit to the second repeating unit is at least 80 to 20.

10. The co-polymer of claim 1, wherein the molar ratio of the first repeating unit to the second repeating unit is at least 85 to 15.

11. The co-polymer of claim 1, wherein the molar ratio of the first repeating unit to the second repeating unit is at least 90 to 10.

12. The co-polymer of claim 1, wherein the molar ratio of the first repeating unit to the second repeating unit is at least 95 to 5.

13. A denture, denture base, denture liner or tissue conditioner comprising the co-polymer of claim 1.

14. A denture comprising the co-polymer of claim 1.

15. A denture base comprising the co-polymer of claim 1.

16. A method for synthesizing a co-polymer of claim 1, the method comprising the steps of:

providing an alkyl or aryl methacrylate monomer and a phosphate-containing monomer having the formula

$$H_2C=C(-CH_3)-X$$

wherein X is selected from the group consisting of $-O-PH_2O_3$ and $-R-O-PH_2O_3$,
wherein the R group in $-R-O-PH_2O_3$ is selected from the group consisting of $-COO-CH_2-CH_2$ and a straight or branched alkyl chain of 10 carbon atoms or less,
wherein the two methylene groups in $-COO-CH_2-CH_2$ and the alkyl carbon chain can be substituted with an aryl group, a cycloalkyl group or both; and

exposing the monomers to conditions under which the monomers polymerize to form a co-polymer.

17. A method for synthesizing a co-polymer of claim 1, the method comprising the steps of:

providing a pre-polymerized polymer, an alkyl or aryl methacrylate monomer and a phosphate-containing monomer having the formula

$$H_2C=C-CH_3$$
$$|$$
$$X$$

wherein X is selected from the group consisting of $-O-PH_2O_3$ and $-R-O-PH_2O_3$,
wherein the R group in $-R-O-PH_2O_3$ is selected from the group consisting of $-COO-CH_2-CH_2$ and a straight or branched alkyl chain of 10 carbon atoms or less,
wherein the two methylene groups in $-COO-CH_2-CH_2$ and the alkyl carbon chain can be substituted with an aryl group, a cycloalkyl group or both; and

exposing the pre-polymerized polymer and the monomers to conditions under which the pre-polymerized polymer and the monomers polymerize to form a co-polymer.

18. A method for making a denture base, the method comprising the steps of:

providing a pre-polymerized polymer resin suitable for making the denture base, and a liquid comprising an alkyl or aryl methacrylate monomer and a phosphate-containing monomer having the formula

$$H_2C=C-CH_3$$
$$|$$
$$X$$

wherein X is selected from the group consisting of $-O-PH_2O_3$ and $-R-O-PH_2O_3$,
wherein the R group in $-R-O-PH_2O_3$ is selected from the group consisting of $-COO-CH_2-CH_2$ and a straight or branched alkyl chain of 10 carbon atoms or less,
wherein the two methylene groups in $-COO-CH_2-CH_2$ and the alkyl carbon chain can be substituted with an aryl group, a cycloalkyl group or both; and

mixing the pre-polymerized polymer resin with the liquid comprising the alkyl methacrylate monomer and the phosphate-containing monomer under conditions that allow the pre-polymerized polymer and the monomers to polymerize to form the denture base.

19. A kit comprising:

a solution that contains an antimicrobial agent for treating the denture, denture base, denture liner or tissue conditioner of claim 13;

an instruction sheet describing how to use the solution to treat the denture, denture base, denture liner or tissue conditioner of claim 13; and optionally

the denture, denture base, denture liner or tissue conditioner of claim 13.

20. The kit of claim 19, wherein the antimicrobial agent is selected from the group consisting of a histatin, a defensin, and a bactenecin.